

## CLAIMS

What is claimed is:

1. A device for soldering contacts on vertically integrated semiconductor chips, comprising:

a clamping device that receives and transports a wafer having components;

a flushing device including a plate with a window, a first gas channel and a first gas outlet opening arranged at the window, the plate being aligned parallel to a transporting area of the clamping device intended for the wafer to be held in position above the clamping device;

a chip mount arranged above the clamping device over the window such that a chip can be held on a side of the chip mount facing the clamping device and over the wafer, and the chip can be brought near the wafer by means of a vertical movement of the chip mount with respect to the wafer; and

a heater that heats a chip held on the chip mount from a side of the chip facing the chip mount at least to a degree that a solder applied to an opposite side of the chip is melted.

2. The device according to Claim 1, wherein the first gas outlet opening is provided around the window.

3. The device according to Claim 1, wherein an edge of the plate facing away from the window is provided with a second gas channel and a second gas outlet opening, which points away from the plate in a direction within a two-dimensional extent of the plate.

4. The device according to Claim 1, wherein the heater comprises a thermal radiation source, which is arranged in such a way that thermal radiation emitted by the thermal radiation source is directed through the chip mount onto the chip.

5. The device according to Claim 4, further comprising a body which is permeable to infrared radiation and with which a pressing pressure is transferred to the chip is fitted in the chip mount.

6. The device according to Claim 1, wherein the heater comprises an induction coil having electrical terminals and is fitted in the chip mount.

7. The device according to Claim 6, further comprising an electrically conducting body fitted in the chip mount and arranged in such a way that the electrically conducting body can be heated by an induction of eddy currents by means of the induction coil.

8. The device according to Claim 6, wherein the induction coil is arranged such that the induction coil induces eddy currents in the solder applied to the chip held on the chip mount, with which currents the solder is melted.

9. A method for soldering contacts on vertically integrated semiconductor chips such that a contact of a chip is soldered onto a contact of a component in a wafer, comprising the steps of:

applying solder to the contact of the chip;

flushing the contacts of the chip and the component with a forming gas;

heating the chip from a side opposite the contact of the chip to melt the solder;

pressing the contacts of the chip and the component onto one another; and

cooling the solder until it solidifies such that the solder undergoes isothermal solidification;

wherein the solder is applied such that in a molten state it forms a layer of a thickness of less than 5  $\mu\text{m}$  on the contact of the chip.

10. The method according to Claim 9, wherein the chip is heated using a thermal radiation source.

11. The method according to Claim 10, wherein the thermal radiation source is a laser radiation source.

12. The method according to Claim 10, wherein the thermal radiation source is a halogen lamp.